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NOTICE OF ALLOWANCE AND FEE(S) DUE

8791 7590 06/26/2008

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER

HUNG, YUBIN

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 06/26/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/815,896

03/31/2004

Yoram Gat

42P17823

9302

TITLE OF INVENTION: IMAGE SEGMENTATION USING BRANCH AND BOUND ANALYSIS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	09/26/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

8791 7590 06/26/2008

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/815,896 03/31/2004 Yoram Gat 42P17823 9302

TITLE OF INVENTION: IMAGE SEGMENTATION USING BRANCH AND BOUND ANALYSIS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$300 \$0 \$1740 09/26/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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HUNG, YUBIN 2624 382-173000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,896	03/31/2004	Yoram Gat	42P17823	9302
8791	7590	06/26/2008	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040			HUNG, YUBIN	
			ART UNIT	PAPER NUMBER
			2624	
DATE MAILED: 06/26/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 954 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 954 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/815,896

Applicant(s)

GAT ET AL.

Examiner

Art Unit

YUBIN HUNG

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to responses filed on 04/10/08 and 04/24/08.
2. ☒ The allowed claim(s) is/are 1-9, 11-15, 17, 18, 22 and 24-30 (re-numbered as 1-24).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 01/07/08
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

Response to Amendment/Arguments

(1) This is in response to the amendment filed on 04/10/08 and the declaration filed on 04/24/08, both have been entered.

(2) In view of the amendment, the objections to the specification and claims have been withdrawn.

(3) In view of the amendment, the 35 USC 101 and 112 rejections have been withdrawn.

(4) In view of the declaration, the 35 USC 102 and 103 rejections have been withdrawn.

EXAMINER'S AMENDMENT

(5) An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

(6) Authorization for this examiner's amendment was given in a correspondence with Applicant's representative Mr. Mark C. Van Ness on June 19, 2008.

(7) The application has been amended as follows:

CLAIMS: Replace all claims with the following:

1. A computer-implemented method comprising:
inserting a state into a queue, wherein a state comprises a set of image segmentations and has a priority representing a bound for a quality of each of its image segmentations, and wherein states in the queue are ordered by their respective priority;
iteratively repeating the following:
extracting the state in the queue having the highest priority;
if the extracted state is a terminal state:

halting and outputting the extracted state as a solution;

if the extracted state is not a terminal state:

refining the extracted state into a plurality of states;

determining the priority of each of the plurality of states; and

inserting the plurality of states into the queue.

2. The method of claim 1, further comprising identifying a structure in the image based on the solution.
3. The method of claim 2, wherein the image is an image of a portion of a microelectronic device.
4. The method of claim 3, wherein the structure comprises a wire structure in the microelectronic device.
5. The method of claim 1, wherein an extracted state is a terminal state if the set of segmentations for the state meets a precision standard.
6. The method of claim 1, wherein refining an extracted state comprises producing a set of segmentation sets that form a partition of the extracted state.

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7. The method of claim 1, wherein the segmentations of the image are based on one or more geometric models.
8. The method of claim 7, wherein the one or more geometric models represent one or more expected structures in the image.
9. The method of claim 1, wherein the quality represents relative intensity of light on pixels of the image.
10. (Canceled)
11. The imaging system of claim 18, wherein the operation of the imaging device is directed automatically based on identification of the structure.
12. The imaging system of claim 18, wherein the structure comprises a nano-structure.
13. The imaging system of claim 18, wherein the device under test comprises a microelectronic device.
14. The imaging system of claim 13, wherein the structure comprises a wiring structure in the microelectronic device.

15. The imaging system of claim 14, wherein the one or more models comprise one or more geometric models of expected wiring structures.
16. (Canceled)
17. The imaging system of claim 18, wherein the quality for a segmentation comprises light intensity homogeneity for the segmentation.
18. An imaging system comprising:
an imaging device, the imaging device to receive an image of a device under test; and
a processing system, the processing system to identify a structure in the image by evaluating one or more sets of segmentations of the image in relation to one or more models of expected structures, wherein evaluating comprises:
inserting a state into a queue, wherein a state comprises a set of image segmentations and has a priority representing a bound for a quality of each of its image segmentations, and wherein states in the queue are ordered by their respective priority;
iteratively repeating the following:
extracting the state in the queue having the highest priority;
if the extracted state meets a standard of precision:

halting and outputting the extracted state as a solution;
if the extracted state does not meet the standard of precision:
refining the extracted state into a plurality of states;
determining the priority of each of the plurality of states;
and
inserting the plurality of states into the queue.

19-21. (Canceled)

22. The imaging system of claim 18, further comprising a focused ion beam tool.

23. (Canceled)

24. The imaging system of claim 13, wherein the imaging system is utilized to analyze the microelectronic device.

25. An article of manufacture comprising:
a machine-readable storage medium storing computer-executable instructions that, when executed by a computer, cause the computer to perform operations comprising:
inserting a state into a queue, wherein a state comprises a set of image segmentations and has a priority representing a bound for a quality

of each of its image segmentations, and wherein states in the queue are ordered by their respective priority;

iteratively repeating the following:

extracting the state in the queue having the highest priority;

if the extracted state is a terminal state:

halting and outputting the extracted state as a solution;

if the extracted state is not a terminal state:

refining the extracted state into a plurality of states;

determining the priority of each of the plurality of states; and

inserting the plurality of states into the queue.

26. The article of manufacture of claim 25, further comprising computer-executable instructions that, when executed by the computer, cause the computer to perform operations comprising identifying a structure in the image based on the solution.
27. The article of manufacture of claim 25, wherein refining an extracted state comprises producing a set of states that form a partition of the extracted state.
28. The article of manufacture of claim 25, wherein the image segmentations in a state are based on one or more geometric models.

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29. The article of manufacture of claim 28, wherein the one or more geometric models represent one or more expected structures in the image.
30. The article of manufacture of claim 25, further comprising computer-executable instructions that, when executed by the computer, cause the computer to perform operations comprising evaluating the quality of a segmentation of the image based on intensity of light falling on pixels of the image.

Allowable Subject Matter

- (8) Claims 1-9, 11-15, 17, 18, 22 and 24-30 as amended are allowed.
- (9) The following is an examiner's statement of reasons for allowance:
- (10) Regarding claim 1, and similarly claims 18 and 25, closest art of record, alone or in combination, does not disclose, teach or fairly suggest having a priority representing a bound for a quality of a set of segmentations ("a state"), iteratively extracting the state with the highest priority and refining the extracted state into more states until a state meeting a terminal condition is extracted as the solution.
- (11) Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

- (12) Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUBIN HUNG whose telephone number is (571)272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the

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examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

(13) Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yubin Hung
Primary Examiner
Art Unit 2624

/Yubin Hung/
Primary Examiner, Art Unit 2624

June 20, 2008